

Specifications for COUPP-2L Hydraulic Cart Auxiliary Control Box

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We need to make some modifications to the COUPP-2L hydraulic controls cart and we need to accomplish them with a minimum of fuss. The functions we will be adding to the cart are as follows:

- 1) Add a relay or other switching device to switch the main control solenoid (expand/compress) of the hydraulic cart. This switching device should have a high impedance input so that we can use a simple +5V DC logic signal from our DAQ to control the valve. This switching device should also have an “and” or logical enabling input so that we can provide an interlock.
- 2) Add a hardware watchdog interlock to enable the switching device (1) if it continues to see a pulse train coming from the DAQ computer.
- 3) Add two pressure transducers (4-20ma current readout devices) to the cart. These will be wired into the auxiliary box and biased using the +24V that is native to the cart
- 4) Add one temperature sensor.

The idea is to make an “Auxiliary Box” and to attach it to the existing Hydraulic Cart instrumentation box using the holes that were provided for an “optional” transducer power supply (which apparently was not a selected option for the COUPP-2L cart.) See Figure 1.

The existing COUPP-2L hydraulic controls cart has a connector called “CONTROL” and a connector called “ALARM” that come out on the bottom of the large wiring chassis on the cart. The schematic for what is inside the wiring chassis is included as Figure 2. Mercifully, the “control” connector comes with +24V, +5V, and ground along with the relay control lines as shown in Figure 3. Currently we pass the CONTROL cable to the DAQ where we switch the relay lines using a relay. This creates trouble with out instrumentation readout, hence the desire to switch to a high impedance logic signal. The idea here is to intercept the CONTROL and ALARM connectors and the instrument cables from the additional T and P sensors in this new Auxiliary Box.

Auxiliary Box Gozintas and Gozoutas:

- 1) J1 – CONTROL: The 12-pin burndy coming from the cart.
- 2) J2 – ALARM: The 4-pin burndy coming in from the cart.
- 3) J3 – INSTRUMENTS - an appropriate grommet or other feedthrough with enough room for three instrument cables (two current readout pressure transducers, one four wire RTD.)
- 4) J4 - T3: A 4-pin Burndy out to the DAQ carrying the RTD signals. Basically we just wire the RTD lines out through this connector. The RTD readout unit in the DAQ is an SCC-RTD01 and that will provide the excitation current source.
- 5) J5 – P4/5: A 4-pin Burndy carrying two current loop readout pressure transducer signals out to the DAQ. The Auxiliary Box should provide the bias to the sensors using the +24V from the cart (perhaps with some additional bypassing at this point...) and wire the current loops out through this connector.
- 6) J6 – CART: a 6 (at least, your call) pin Burndy carrying the logic control signals to the DAQ. These pins need to include.
 - a. +5 V_{SS} which is for the optically isolated logic out units
 - b. GND (this is the cart ground)
 - c. “VALVE CONTROL” logic signal from the DAQ. This comes from a National Instruments SCC-DO01 (which requires the V_{SS} and GND)
 - d. WATCHDOG MONITOR” is a logic signal from the DAQ. Ditto from a NI SCC-DO01.
 - e. “WATCHDOG STATE” is a copy of the watchdog level coming back from the Auxiliary Box to the DAQ. We’ll pick this up with an SCC-DI01.
 - f. “ALARM” is a +24V logic signal coming in from the cart. (
 - g. The Auxiliary Box needs to provide the +5 and GND to the DAQ. The DAQ sends back “VALVE CONTROL” and “WATCHDOG PULSE.” If the watchdog pulse keeps the watchdog monitor happy, then the valve control actuates the relay and that actuates the cart solenoid valve.

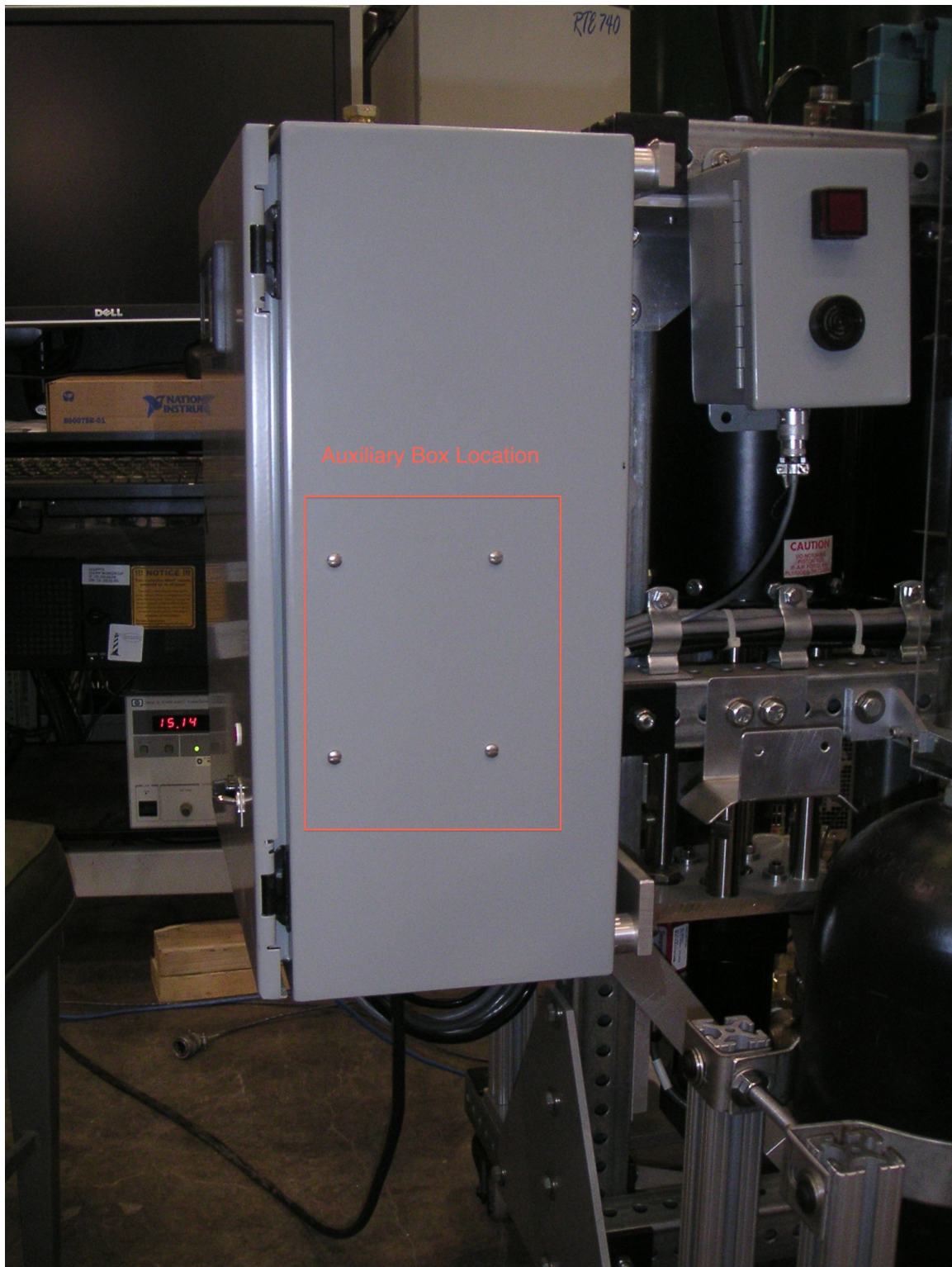


Figure 1: The attachment point for the Auxilliary Box.

COUPP Connector Wiring List

Control Connector

BURNDY TRIM TRIO BANTAM GOB 14-92 SNE, 12 SOCKET CONTACTS

Pin A	+24 V DC Power	1 amp available
Pin B	+24 V Ground	
Pin C	Valve Power (+24 VDC)	
Pin D	Valve Return (Control)	+24 V needs to be supplied to this pin to activate (depressurize) system
Pin E	+5V DC Power	300 ma available
Pin F	Control Signal Out	Unassigned (Pulled Down, Grd when On)
Pin G	Control Signal Out	Unassigned (Pulled Down, Grd when On)
Pin H	Control Signal In	Unassigned (Grd signal is On)
Pin J	Control Signal In	Unassigned (Grd signal is On)
Pin K		
Pin L		
Pin M		
Pin N		

Alarm Connector

BURNDY TRIM TRIO BANTAM GOB 10-4 SNE, 4 SOCKET CONTACTS

Pin A	+24 V DC Power	1 amp available
Pin B	Alarm Output	PLC Controlled Alarm Signal (Grd is ON)
Pin C	+24 V Ground	
Pin D		

Figure 3: Pin tables for the "Control" and "Alarm" connectors.